

Abstract

An isolation system is provided that is suitable for use in telephony, medical instrumentation, industrial process control and other applications. Preferred embodiments of the invention comprise a capacitive isolation barrier across which a digital signal is communicated. The system provides a means of communication across the isolation barrier that is highly immune to amplitude and phase noise interference. Clock recovery circuitry may be employed on one side of the isolation barrier to extract timing information from the digital signal communicated across the barrier, and to filter the effects of phase noise introduced at the barrier. Delta-sigma converters may be disposed on both sides of the isolation barrier to convert signals between analog and digital domains. An isolated power supply may also be provided on the isolated side of the barrier, whereby direct current is generated in response to the digital data received across the isolation barrier. A bidirectional isolation system is provided whereby bidirectional communication of digital signals is accomplished using a single pair of isolation capacitors. In preferred embodiments, the digital data communicated across the barrier consists of digital delta-sigma data signals multiplexed in time with other digital control, signaling and framing information. Finally, the isolation system may include a pulse transformer to accommodate ADSL circuitry, whereby power is transmitted through the pulse transformer.